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Maquiladora Recovery: Lessons for the Future

By Jesus Cañas, Roberto Coronado and Robert W. Gilmer

Competition from low-wage countries around the world has slowly reshaped the maquiladoras' role in U.S.–Mexico production sharing.

Maquiladoras began in 1965 as an economic development program to relieve unemployment and poverty in northern Mexico. The organizing principle was to provide a platform for low-wage labor to perform unskilled assembly operations, with components and completed goods moving across the U.S.–Mexico border duty-free.

These factories have grown to be a major engine of Mexico's economy, providing jobs for 1.2 million workers—a third of the country's manufacturing employment. The industry has encountered booms and busts in recent years, and competition from low-wage countries around the world has slowly reshaped the maquiladoras' role in U.S.–Mexico production sharing.

In 2000–01, a slump in maquiladora employment raised serious concerns about the industry's future. The U.S. recession in 2001 triggered the downturn, which was worsened by the prolonged struggles of U.S. manufacturing in the face of a strong dollar and a drop in investment. Low-wage competition from China and other emerging economies led to questions about whether maquiladora jobs would return once the cyclical recovery began. Had a Mexican industry built on low-wage assembly jobs simply lost an edge it could never reclaim?

Maquiladora employment turned upward again in 2003, offering clues to the long-term future of this important industry (*Chart 1*). Although the assembly plants have lost significant ground in several low-wage sectors, they've found new ways to grow and compete. Productivity has risen rapidly, as have wages. The maquiladora industry isn't dying. Rather, it's maturing and leaving behind its roots as a low-wage industry. Just as important, the industry continues to provide increasing stimulus to the economic growth of both Mexican and U.S. border cities.

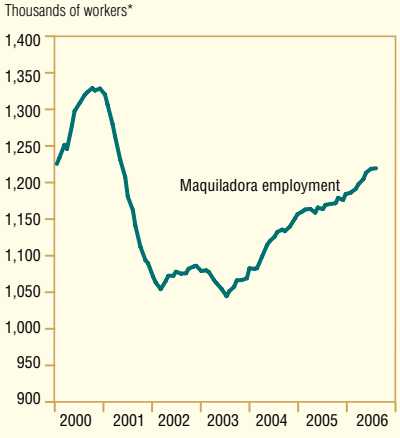
Low-Wage Competition

Based strictly on head-to-head competition in hourly wages, Mexico can't win when compared with low-wage countries around the world.[1]

Mexico's Economic Ministry, for example, estimates that the country pays average wages and benefits of $2.96 an hour, a rate highly advantageous when compared with California's $16.60 an hour but highly unfavorable when compared with China's 72 cents an hour. The U.S. Bureau of Labor Statistics puts Mexican manufacturing wages at $2.08 an hour, compared with 48 cents in Sri Lanka. The International Labor Organization estimates Chinese manufacturing wages at 25 cents an hour.

This inability to compete on labor costs has been most telling in Mexico's textile and apparel industries. A recent article by William C. Gruben points out that the North American Free Trade Agreement's passage in 1994 gave this industry a privileged position in the U.S. market by keeping it inside the region's tariff walls.[2] The initial result was a diversion of apparel producers to

Chart 1
Jobs Return After Bust



*Seasonally adjusted.
SOURCES: Instituto Nacional de Estadística Geografía e Informática; authors' calculations.

Mexico to take advantage of tariff-free access to the U.S. market. By 2000, Mexico's apparel employment had quadrupled.

Others then began to seek similar advantages. The Caribbean Basin Economic Recovery Act in 2000 provided Caribbean countries with duty-free entry into the U.S. market. By joining the World Trade Organization in 2001, China gained U.S. access, with tariffs low enough to make its wage advantage decisive. These post-NAFTA changes in trade policy led to a collapse of Mexican textile and apparel employment. The sector's job losses haven't been reversed by the recovery of U.S. manufacturing.

The textile and apparel sector hasn't been a bellwether for the maquiladora industry as a whole. Low-wage job losses haven't been widespread, with textile and apparel's sustained decline shared only by the relatively small leather and toy industries. Other maquiladora sectors have responded positively to the upturn in U.S. manufacturing that began in 2004.

How does Mexico manage to hold its own in other industries if competition based on wages isn't feasible?[3] The answer probably lies in a combination of factors related to its geography and experienced labor force:

• Proximity to the U.S. market offers huge advantages. This works for large, bulky items, such as big-screen TVs, freezers and water heaters.

• Proximity also is important when supply chains require quick turnarounds, when changes are frequent or when there's little time to wait for shipments from overseas. Auto parts are one example. For high-fashion jeans, the latest styles can be passé before containers arrive from Asia.

• Goods with high value added relative to labor content, such as medical instruments, are often made in Mexico. The country's skilled and experienced labor force becomes an important advantage.

• Intellectual property used in the production process can be at risk overseas, and Mexico offers better protections than many other countries.

Cyclical or Structural?

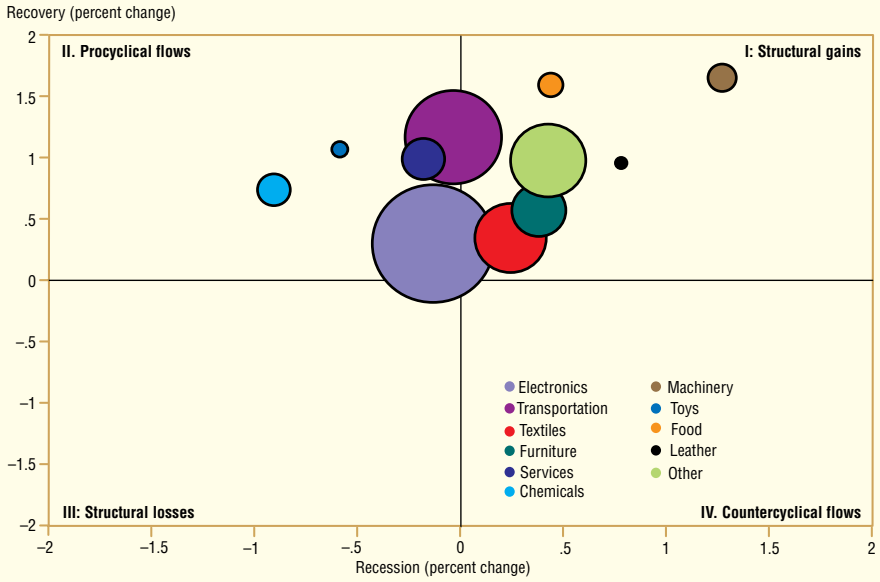
Are Mexico's advantages enough to matter for the maquiladoras? To find out, we need to separate cyclical effects from longer-term structural declines or gains.

Maquiladora data cover broad industry categories. Each of them may contain a mix of sectors subject to either cyclical effects or structural factors, such as low-wage competition. To determine which dominates, we examine data from the recent downturn and recovery.

We assume U.S. manufacturing output defines the maquiladora industry's decline and recovery. We track the fall in maquiladora jobs during the decline in U.S. industrial production from June 2000 to November 2001 and during its long recovery from November 2001 to May 2004.

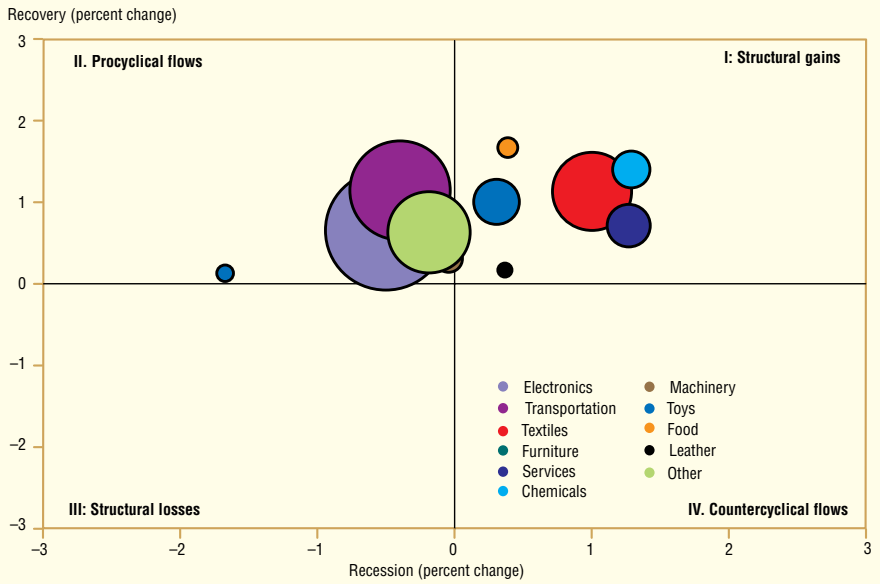
To display how recession and recovery affected each sector, we use a four-quadrant graph that separates the maquiladora sectors into groups based on how they performed over the business cycle.[4] Gains and losses are shown as percentage changes in employment.

Chart 2
Cyclical vs. Structural Change in Maquiladora Employment, 2000–04



SOURCES: Instituto Nacional de Estadística Geografía e Informática; authors' calculations.

Chart 3
Cyclical vs. Structural Change in Maquiladora Employment, 1990–92



SOURCES: Instituto Nacional de Estadística Geografía e Informática; authors' calculations.

Quadrant I (positive, positive): Sectors with structural gains, in which employment grows in recession and recovery.

Quadrant II (negative, positive): Cyclical sectors, which shed jobs in recession and add them in recovery.[5]

Quadrant III (negative, negative): Sectors with structural losses, in which employment declines in both recession and recovery.

Quadrant IV (positive, negative): Countercyclical sectors, which see job counts rise in recession and fall in recovery.

For 2000–04, we find structural gains in only two small sectors—machinery and food (*Chart 2*). Structural losses took place in furniture and three industries we had already anticipated—toys, leather and textiles. The large electronics sector and the transportation industry, which includes automobiles, fall into the cyclical quadrant.

Let's look at similar data for maquiladora employment during the 1990–92 decline and recovery of U.S. manufacturing (*Chart 3*).[6] In contrast to the recent business cycle, every industry falls into the structural gains or cyclical quadrants. The only industry that seems subject to a larger employment decline than recovery is toys. All told, the 1990–2004 period saw Mexico's maquiladoras move from an advantaged position in creating jobs (quadrants I and II) to a much more competitive one (quadrants II and III).

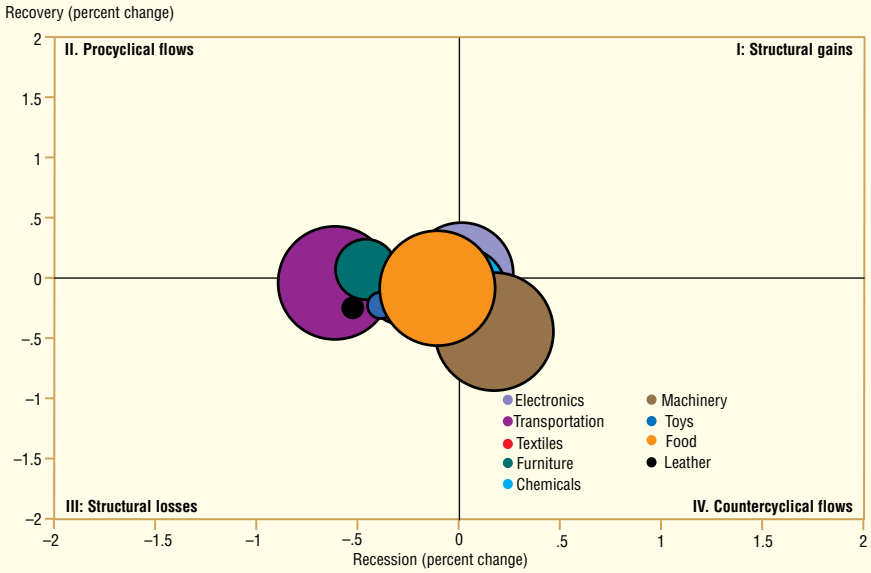
When we examine the corresponding U.S. industries for 2000–04, we see most of them clustering near the point of origin, with some bias toward a small decline in the downturn and less of an upturn in recovery (*Chart 4*). Between 1990 and 1992, the results are similar, though with larger declines in the downturn and more limited recovery in industries such as furniture, autos, leather and electronics.

Production Perspective

The unfolding trends in maquiladora employment don't lead to an optimistic view of the industry's future. Recovery from the 2000–03 downturn is still incomplete based on jobs, and it's apparent the easy structural gains of the past are gone.

The focus on jobs is important and conventional when looking at the maquiladora industry because structural displacement through trade is properly viewed as a key labor market issue and because the maquiladora industry historically has been regarded primarily as a jobs program.

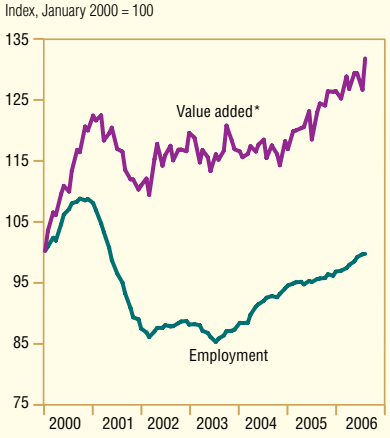
Chart 4
Cyclical vs. Structural Change in U.S. Manufacturing Employment, 2000–04



SOURCES: Bureau of Labor Statistics; authors' calculations.

Switching the focus to output rather than jobs, however, turns the story on its head. Measured by real value added, maquiladora production has held up surprisingly well in recent years, especially in light of what was happening to employment (*Chart 5*). After turning down briefly in 2001, output largely recovered and remained flat from mid-2001 to late 2004. It has been growing rapidly for nearly two years now, reaching new highs. According

Chart 5
Output Recovers Faster Than Jobs



*Real, seasonally adjusted.

NOTE: Output is measured as "value added."

SOURCES: Instituto Nacional de Estadística Geografía e Informática; authors' calculations.

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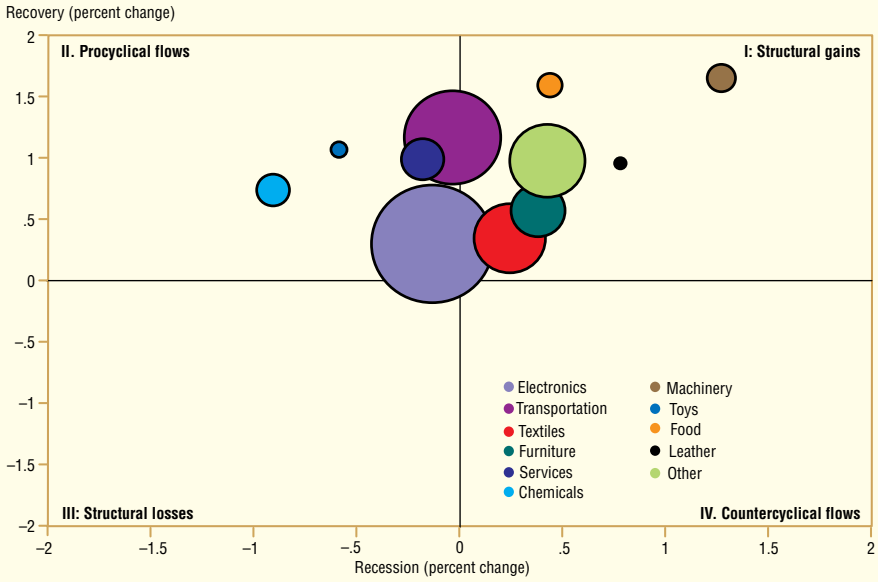
As maquiladora recovery has moved forward, job growth has remained weak and below the prior peak, while output has surged to new highs.

Chart 6
Cyclical vs. Structural Change in Maquiladora Value Added, 2000–04



SOURCES: Instituto Nacional de Estadística Geografía e Informática; authors' calculations.

to production data, the most recent recession was much less significant than the one in the early 1990s.

If we return to the cyclical-versus-structural graphic and replace employment with real value added, we see six sectors in the structural gains quadrant over the 2000–04 decline and recovery—including furniture, textiles and leather (*Chart 6*). Other sectors are in the procyclical quadrant. Growth over the period was generally positive and widely spread among these industries.

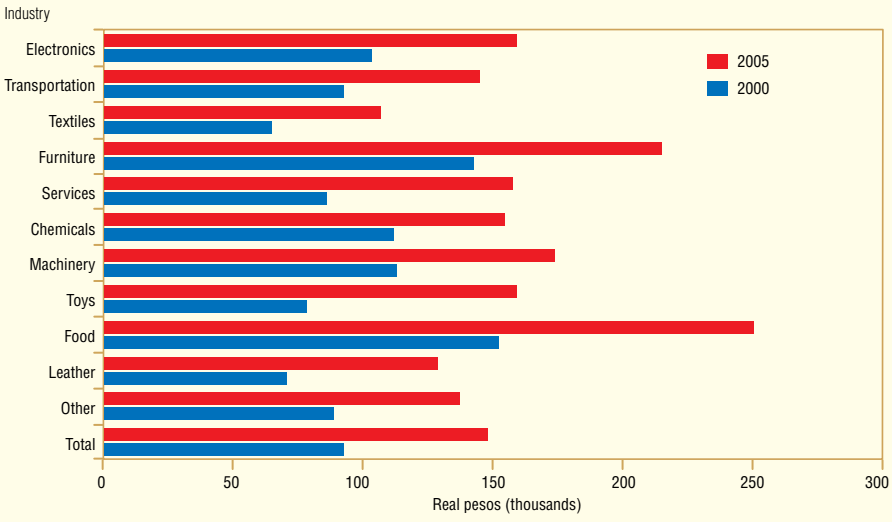
As maquiladora recovery has moved forward, job growth has remained weak and below the prior peak, while output has surged to new highs. The result has been rapid gains in productivity as measured by output per worker, with increases of nearly 60 percent from 2000 to 2005 (*Chart 7*).

Productivity gains have also been a hallmark of recent U.S. manufacturing performance, outweighing either slack demand or foreign competition as a factor in recent job losses.[7] In the maquiladora industry, we know that a substantial part of the gain in output per worker can be traced to the shift from less- to more-productive industries. The simplest jobs have been lost to foreign competition.[8] We lack the data to determine how much of the productivity gain was due to industry mix and how much emerged from advances in skills, improved capital or new technology.

Higher productivity has been matched by rapid gains in maquiladoras' hourly wages and benefits. These gains have been shared across all industries, with an average increase of 46 percent between 2000 and 2005. Like rising productivity, higher wages can be traced in part to the loss of the lowest-paid and least-skilled jobs.

No matter what the source of improvements, we are seeing an industry that is rapidly modernizing, paying higher wages

Chart 7
Output per Worker in the Maquiladoras



SOURCES: Instituto Nacional de Estadística Geografía e Informática; authors' calculations.

and ramping up production across all industries. This picture contrasts dramatically with the view of the maquiladora industry based on employment alone.

It's time to stop thinking of the maquiladora industry in terms of its origins as a 1960s-style jobs program. Today, the industry is successfully seeking a more sophisticated and better-paying niche in the ongoing restructuring of North American production sharing.

If maquiladoras generate fewer jobs than they did in the past, this has to be seen in light of labor shortages in northern Mexico, where the industry is primarily located. The maquiladoras are recruiting diligently throughout Mexico, offering bonuses and paying transportation costs to potential workers to persuade them to move north.

Stimulus to the Border Economy

What are the implications for the Texas–Mexico border economy? Maquiladoras have become a dominant force in the region. Keeping and adding maquiladora jobs has become the most important economic factor for cities on the Mexican side. In light of the industry's transitions, however, we need to distinguish between the raw number of jobs and total wages and benefits.

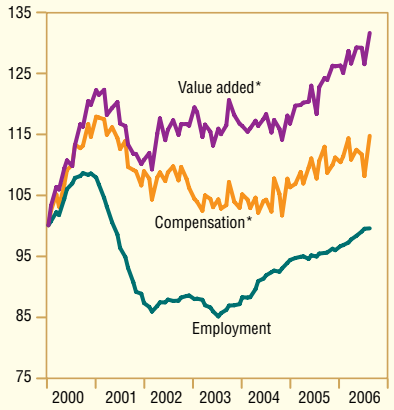
Real compensation per worker tracks an intermediate path between production and employment (*Chart 8*). The decline in jobs during the downturn was 21.8 percent, and the employment recovery still leaves the industry 8.3 percent below the prior peak in 2000. Total real wages and benefits declined 13.3 percent and are now only 2.7 percent short of the prior peak.

Overall, Mexican border cities probably suffered much less during the downturn than the decline in job numbers would suggest, and they're now benefiting more from the recovery.

For cities on the Texas side, maquiladora jobs and wages count to the extent that they affect retail sales. However, output has always been a better measure than employment of the benefits of maquiladora expansion. Inputs to maquiladora production, along with transportation, border security, real estate services and customs support services, are all more closely connected to output than jobs.

A well-known rule of thumb for how U.S. border cities and maquiladoras are linked also suggests that output is the key measure: Every 10 percent increase in maquiladora production drives a 1.1 to 2 percent employment increase in the adjacent U.S. border city.[9] It also helps explain the strong performance of Texas border cities in recent years—even in the face of a decline in maquiladora employment.

Chart 8
Total Compensation Paid by the Maquiladora Industry, 2000–06



*Real, seasonally adjusted.

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Notes

[1] We have used wages as shorthand in the text, but the real story is unit labor costs—a combination of wages and productivity. If Mexican workers were sufficiently productive, they could overcome the wage difference with higher levels of output. However, to close the gap, Mexican workers would have to be 11.8 times as productive as Chinese workers ($2.96 vs. 25 cents). For basic assembly work, this would be a formidable gap to overcome.

[2] "NAFTA, Trade Diversion, and Mexico's Textile and Apparel Boom and Bust," by William C. Gruben, Federal Reserve Bank of Dallas *Southwest Economy*, September/October 2006. "The China Challenge to Manufacturing in Mexico," by Ralph Watkins, *Impact Analysis*, November/December 2006, makes similar points about diversion.

[3] "Maquiladora Downturn: Structural Change or Cyclical Factors?" by Jesus Cañas, Roberto Coronado and Bill Gilmer, Federal Reserve Bank of Dallas *Business Frontier,* Issue 2, 2004.

[4] The graphical device is borrowed from Erica L. Groshen and Simon Potter, "Has Structural Change Contributed to a Jobless Recovery?" Federal Reserve Bank of New York *Current Issues in Economics and Finance*, vol. 9, no. 8, August 2003. Our display differs from Groshen and Potter's in that the contraction and recovery dates used are not the NBER business-cycle dates but peaks and troughs in the U.S. industrial production index published by the Federal Reserve Board. These charts have been criticized for being potentially misleading based on the time periods chosen for recovery and expansion. We did enough sensitivity tests to assure ourselves that the simple conclusions we wanted to draw were not the result of dates chosen. See "Can Sectoral Reallocation Explain the Jobless Recovery?" by Daniel Aaronson, Ellen R. Rissman and Daniel G. Sullivan, Federal Reserve Bank of Chicago *Economic Perspectives*, Second Quarter 2004.

[5] Recovery is the period from recession trough to return to the prior peak.

[6] The dates for industrial decline were September 1990 to March 1991, and the recovery was complete in March 1992.

[7] "What Happened to the Great U.S. Job Machine? The Role of Trade and Electronic Offshoring," by Martin Neil Baily and Robert Z. Lawrence, *Brookings Papers on Economic Activity*, September 2004. This study shows that all the losses of U.S. manufacturing jobs from 2000 to 2003 can be attributed to productivity gains. Holding productivity fixed, 88 percent of the losses would be attributed to slack demand for manufactured goods and only 12 percent to trade.

[8] To see how a change in mix can raise overall productivity, even with no increase in productivity within sectors, consider this simple example: Sector A has productivity of 10 units per worker and B has 4 units per worker. If employment is divided 50–50, overall productivity is $.5 \times 10 + .5 \times 4 = 7$. If industry mix shifts (due to a loss of low-wage/low-productivity jobs) to 75–25, overall productivity increases: $.75 \times 10 + .25 \times 4 = 8.5$.

[9] "U.S.–Mexico Integration and Regional Economies: Evidence from Border-City Pairs," by Gordon H. Hanson, *Journal of Urban Economics*, vol. 50, September 2001, pp. 259–87.